A STUDY OF SERUM CHOLINESTERASE IN ACUTE MYOCARDIAL INFARCTION AND ITS PROGNOSTIC SIGNIFICANCE

INTRODUCTION

Ischemic heart disease are becoming progressively commoner in the younger persons of third and fourth decade. Myocardial infarction is the irreversible death of heart muscle secondary to lack of blood(oxygen) supply. Patient may present with chest pain, breathlessness, fatigue, excessive sweating and palpitation. ECG is the most important tool in the initial evaluation and triage of patients in whom an acute coronary syndrome such as myocardial infarction is suspected. ECG is confirmatory of diagnosis in approximately 80% of cases. Other supportive evidence in the diagnosis of myocardial infarction is cardiac biomarkers and cardiac imaging. Serum cholinesterase is an enzyme that deacetylates acetyl choline to choline and acetic acid at high substrate level. The active centre of the enzyme contains both anionic and esteric site. Some studies have concluded that earlier and rapid fall in serum cholinesterase level of myocardial infarction patients resulted in a grave prognosis. Hence the association between serum cholinesterase in acute myocardial infarction and its use as prognostic marker is studied.

AIMS AND OBJECTIVES

- To study the incidence, levels and patterns of serum cholinesterase activity in acute myocardial infarction.
- To assess the relationship between the rise and fall of serum cholinesterase in myocardial infarction
- To determine the prognosis with relation to changing trend of serum cholinesterase

MATERIALS AND METHODS

- The main goal of this study was to evaluate the level of serum cholinesterase in Acute myocardial infarction and its prognostic significance
- Serum cholinesterase level in myocardial infarction decreases after 12 hours of onset of symptom probably due to decreased synthesis of enzyme due to hypoxic condition of the liver or there may be more peripheral utilization of this enzyme.
- An earlier and persistent fall in the serum cholinesterase level assessed on the day of admission, day 3, day 5 indicates poor prognosis.
- The study was carried out in Government Rajaji Hospital wherein 100 cases of acute ST elevation myocardial infarction were included in the study. Age, sex, alcoholic/ smoking, BMI for each patients were assessed. Routine

investigations were done along with ECG and ECHO. Patients were closely monitored and treatment according to the guidelines were done. The level of serum cholinesterase was done on the day of admission, day 3 and day 5. The decreasing/ increasing trend of serum cholinesterase were determined. At the end of 7^{th} day ECG, ECHO were done and patients reassessed. The group of patients who had significant fall in the serum cholinesterase level had poor outcome in the form of MACE.

DESIGN OF STUDY

- Observational prospective study

PERIOD OF STUDY

- Feb 2018 to July 2018

INCLUSION CRITERIA

- All patients with Acute ST elevation myocardial infarction

EXCLUSION CRITERIA

- Patients with onset of symptom(chest pain) >48 hours
- Liver disease(hepatitis, cirrhosis, malignancy)
- Malignancies
- Chronic renal failure
- Dermatomyositis

- Nephrotic syndrome
- Toxic goitre
- Patients receiving sympathomimetic drug, phenothiazine derivative and atropine or its analogues

RESULTS AND OBSERVATION

1) Among 100 patients of myocardial infarction, most of them are middle aged with 6 cases of age <40, 34 cases in age group of 41-50, 26 cases were in the age group of 51-60, 22 cases were in the age group of 61-70, 12 cases were in the age group of >70. Age is not significantly related to cholinesterase level
2) Among 100 cases in this study majority were males. Out of 100 cases, 72 cases were males and the remaining 28 were females. This shows that myocardial infarction is predominant in male population. Sex does not influence the level of cholinesterase
3) Among 100 people diagnosed as myocardial infarction, 57 cases were alcoholic and the remaining 43 were non- alcoholic. Unless the patient is not suffering from alcoholic liver disease, the alcohol consumption does not affect the level of cholinesterase
4) Among 100 cases who were taken up for the study the distribution of smoking was found. About 58 cases were found to have the habit of smoking. The

remaining 42 cases were non- smokers. Smoking does not significantly affect the level of cholinesterase.

5) Among 100 cases the distribution of BMI was studied. About 7 cases had the BMI of <20, 45 cases had the BMI of 20-24, 38 cases had the BMI of 25-29, 10 cases had the BMI of >29. The level of cholinesterase has no significant association with regards to body mass index.

6) Major adverse cardiac events involves conditions like mortality, heart block, ejection fraction <35% as determined by ECHO and arrhythmias.

7) Based upon the presence or absence of MACE, the myocardial infarction patients were categorized as complicated and uncomplicated groups. The presence of MACE indicates complicated group and the absence indicates uncomplicated group.

8) Depending upon the presence or absence of MACE, myocardial infarction patients were categorized into 2 groups namely complicated and uncomplicated group. In our study about 62 cases were included in the complicated group due to the occurrence of MACE. The remaining 32 were categorized as uncomplicated since there were no MACE events.

9) On comparing the mean of cholinesterase level in complicated and uncomplicated group it is found that the level of cholinesterase level falls significantly in the complicated group than the individuals grouped into the

uncomplicated group. This indicates that the decrease in cholinesterase level below normal following myocardial infarction is associated with complications in the form of mortality, EF<35%, Arrhythmias, heart block

CONCLUSION

The patients who had persistent fall in the serum cholinesterase level had poor prognostic outcome in the form of experiencing major adverse cardiac events. The level of serum cholinesterase level was compared between the complicated and uncomplicated group and found that patients in complicated group had significant fall in the serum cholinesterase measured on the day of admission, day 3 and day 5. Hence fall in serum cholinesterase level can be used as a poor prognostic indicator in ST elevation acute myocardial infarction.

KEY WORDS

Myocardial infarction, serum cholinesterase, EF, Arrhythmias